

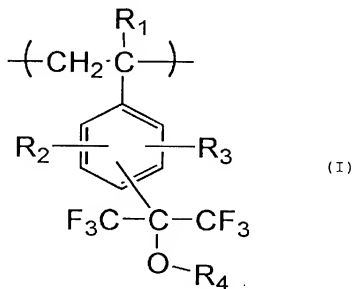
What is claimed is:

1. A positive resist composition comprising:

(A) a resin capable of decomposing by the action of an acid to increase the solubility in an alkali developer; and

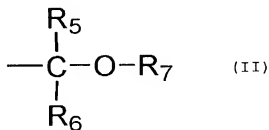
(B) a compound capable of generating an acid upon irradiation with one of an actinic ray and a radiation,

wherein the resin (A) contains a repeating unit represented by formula (I):



wherein R<sub>1</sub> represents a hydrogen atom, a halogen atom, cyano group, an alkyl group which may be substituted or haloalkyl group which may be substituted; R<sub>2</sub> and R<sub>3</sub>, which are the same or different, each independently represents a hydrogen atom, hydroxyl group, a halogen atom, cyano group, an alkoxy group, an acyl group, an alkyl group which may be substituted, cycloalkyl group which may be substituted, alkenyl group which

may be substituted, aralkyl group which may be substituted or aryl group group which may be substituted;  $R_4$  represents a hydrogen atom, an alkyl group which may be substituted, perfluoroalkyl group which may be substituted, cycloalkyl group which may be substituted, acyl group which may be substituted, alkoxycarbonyl group which may be substituted, alkoxycarbonylmethyl group which may be substituted or a group represented by formula (II):



wherein  $R_5$  and  $R_6$ , which are the same or different, each independently represents a hydrogen atom, an alkyl group which may be substituted or cycloalkyl group which may be substituted;  $R_7$  represents an alkyl group which may be substituted, perfluoroalkyl group which may be substituted, cycloalkyl group which may be substituted, perfluorocycloalkyl group which may be substituted, aralkyl group which may be substituted or aryl group which may be substituted; two of  $R_5$ ,  $R_6$  and  $R_7$  may combine with each other to form a ring.

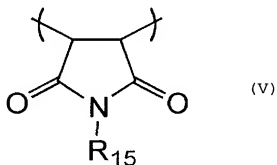
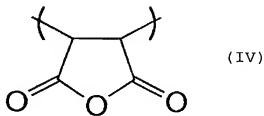
2. The positive resist composition according to Claim 1, wherein the resin (A) further contains a repeating unit represented by formula (III):



wherein  $\text{R}_8$  and  $\text{R}_9$ , which are the same or different, each independently represents a hydrogen atom, a halogen atom, cyano group, an alkyl group which may be substituted or a haloalkyl group which may be substituted;  $\text{R}_{10}$  represents a hydrogen atom, a halogen atom, an alkyl group which may be substituted, a haloalkyl group which may be substituted or a group represented by  $-\text{A}_1\text{CN}$ ;  $\text{A}_1$  represents a single bond, an alkylene group which may be substituted, alkenylene group which may be substituted, cycloalkylene group which may be substituted or arylene group which may be substituted,  $-\text{O}-\text{CO}-\text{R}_{11}-$ ,  $-\text{CO}-\text{O}-\text{R}_{12}-$  or  $-\text{CO}-\text{N}(\text{R}_{13})-\text{R}_{14}-$ ;  $\text{R}_{11}$ ,  $\text{R}_{12}$  and  $\text{R}_{14}$ , which are the same or different, each independently represents a single bond, an alkylene, alkenylene, cycloalkylene or arylene group, each of which may contain an ether group, an ester group, an amido group, a urethane group or a ureido group;  $\text{R}_{13}$  represents a hydrogen atom, an alkyl

group which may be substituted, cycloalkyl group which may be substituted, aralkyl group which may be substituted or aryl group which may be substituted.

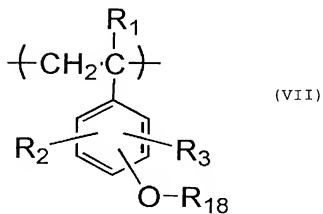
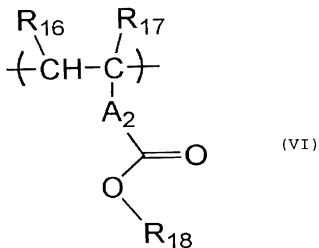
3. The positive resist composition according to Claim 1, wherein the resin (A) further contains at least one of repeating units represented by formulae (IV) and (V).



wherein  $R_{15}$  represents a hydrogen atom, or an alkyl group which may be substituted, perfluoroalkyl group which may be substituted, cycloalkyl group which may be substituted, perfluorocycloalkyl group which may be substituted or aryl group

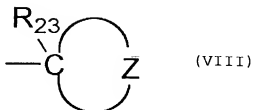
which may be substituted.

4. The positive resist composition according to Claim 1, wherein the resin (A) further contains at least one of repeating units represented by formulae (VI) and (VII).



wherein  $R_1$  represents a hydrogen atom, a halogen atom, cyano group, an alkyl group which may be substituted or haloalkyl group which may be substituted;  $R_2$  and  $R_3$ , which are the same or different, each independently represents a hydrogen atom, hydroxyl group, a halogen atom, cyano group, an alkoxy group, an acyl group, an alkyl group which may be substituted, cycloalkyl group which may be substituted, alkenyl group which may be substituted, aralkyl group which may be substituted or aryl group group which may be substituted;  $R_{16}$  and  $R_{17}$ , which are the same or different, each independently represents a hydrogen atom, a halogen atom, cyano group, an alkyl group which may be substituted or a haloalkyl group which may be substituted;  $R_{18}$  represents  $-C(R_{19})(R_{20})(R_{21})$ ,  $-C(R_{19})(R_{20})(R_{22})$ , or the group represented by formula (VIII) below;  $R_{19}$  to  $R_{22}$ , which are the same or different, each independently represents an alkyl group, a mono- or polycyclic cycloalkyl group, an alkenyl group, an aralkyl group or an aryl group, each of which may be substituted; two of  $R_{19}$ ,  $R_{20}$  and  $R_{21}$  or two of  $R_{19}$ ,  $R_{20}$  and  $R_{22}$  may combine with each other to form a ring;  $A_2$  represents a single bond, an alkylene group which may be substituted, alkenylene group which may be substituted, cycloalkylene group which may be substituted or arylene group group which may be substituted,  $-O-CO-R_{11}-$ ,  $-CO-O-R_{12}-$  or  $-CO-N(R_{13})-R_{14}-$ ;  $R_{11}$ ,  $R_{12}$  and  $R_{14}$ , which are the same or different, each independently represents a single bond, an alkylene, alkenylene, cycloalkylene or arylene group, each of

which may contain an ether group, an ester group, an amido group, a urethane group or a ureido group;  $R_{13}$  represents a hydrogen atom, an alkyl group which may be substituted, cycloalkyl group which may be substituted, aralkyl group which may be substituted or aryl group which may be substituted:



wherein  $R_{23}$  represents an alkyl group, cycloalkyl group, alkenyl group, alkynyl group, aralkyl group or aryl group, each of which may be substituted; Z represents an atomic group forming a mono- or polycyclic alicyclic group together with the carbon atom.

5. The positive resist composition according to Claim 1, which further comprises (C) a compound containing a basic nitrogen atom as an acid diffusion-suppressing agent.

6. The positive resist composition according to Claim 1, wherein the compound (B) is at least one selected from the group consisting of a sulfonium salt compound and an iodonium

salt compound capable of generating the following acid upon irradiation with one of an actinic ray and a radiation:

at least one acid of a perfluoroalkylsulfonic acid having at least 2 carbon atoms, a perfluoroarylsulfonic acid and an arylsulfonic acid substituted with a perfluoroalkyl group.

7. The positive resist composition according to Claim 1, wherein the compound (B) is at least one selected from the group consisting of an imide-N-sulfonate compound, an oxime-N-sulfonate compound and a disulfonic compound.

8. The positive resist composition according to Claim 1, wherein the resin (A) contains the repeating unit represented by formula (I) in an amount of 20 to 100 mol% based on the total components of the resin.

9. The positive resist composition according to Claim 1, wherein the resin (A) has a weight average molecular weight of 1,000 to 200,000.

10. The positive resist composition according to Claim 1, which comprises the resin (A) in an amount of 50 to 99.5 % by weight, based on the total solid content of the composition.

11. The positive resist composition according to Claim



1, which comprises the compound (B) in an amount of 0.1 to 20 % by weight, based on the total solid content of the composition.

12. The positive resist composition according to Claim 1, which further comprises a surfactant containing at least one of a fluorine atom and a silicon atom.

13. The positive resist composition according to Claim 1, which is a positive resist composition to be irradiated with a vacuum ultraviolet ray having a wavelength of not longer than 160 nm.

14. The positive resist composition according to Claim 1, which is a positive resist composition to be irradiated with F<sub>2</sub> excimer laser beam having a wavelength of 157 nm.

15. A method for forming a pattern comprises: applying the positive resist composition according to claim 1 on a substrate to form a resist film; irradiating the resist film with a vacuum ultraviolet ray having a wavelength of not longer than 160 nm; and developing the resist film.

16. The method for forming a pattern according to claim 15, wherein the vacuum ultraviolet ray is F<sub>2</sub> excimer laser beam having a wavelength of 157 nm.